

**RADICAL**



*An Epic Adventure to Make*

*Bio Willie Famous in America*







AR TRANSAMERICA

emp.com

IF HEMP CAN  
POWER CARS...  
WHY IS IT ILLEGAL?  
HEMPCAR.ORG



hemp  
OIL  
canada  
inc.



GEN-X  
RESEARCH INC.

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EARTHHEMP

Cannabis News  
Informing the public about cannabis  
www.cannabisnews.com

WWW.HEMPCAR.ORG

NORML  
The growing industry and government



Boston  
Hemp  
Festival  
Burlington VT

**R**eflect

**A**ssess

**D**ream

**I**nternational

**C**onsensus

**A**dvocate

**L**eadership

REFLECT













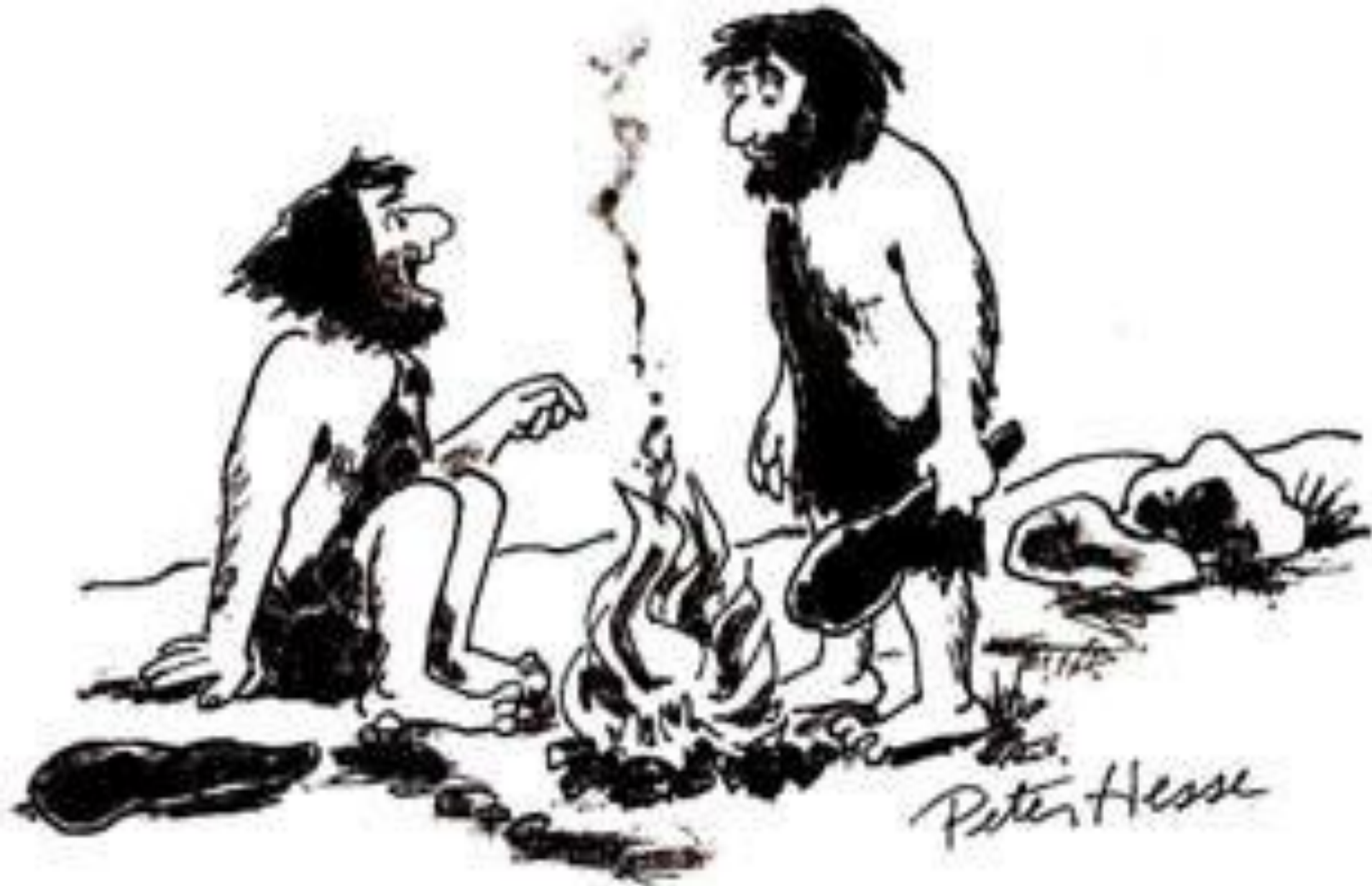




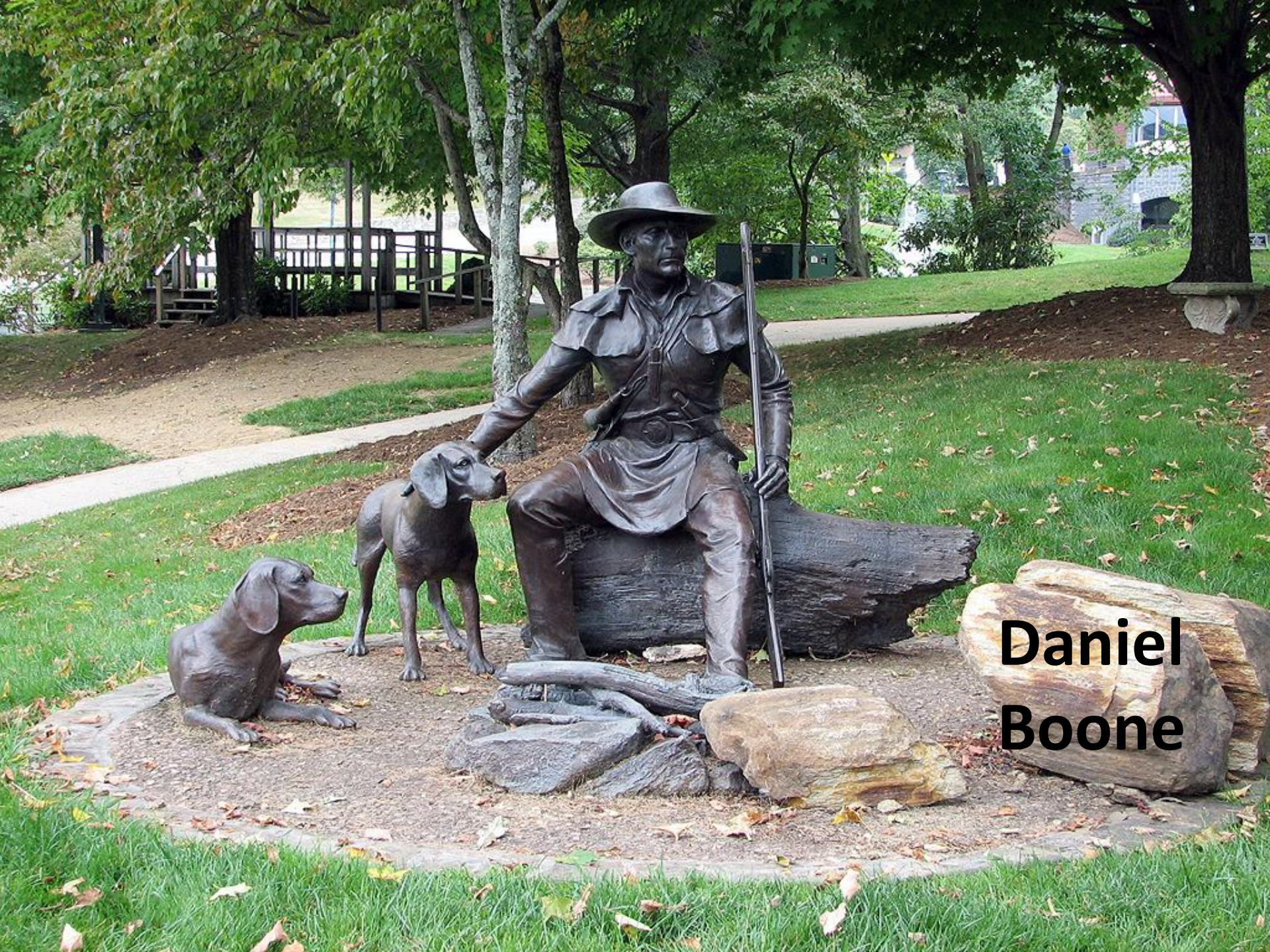
VIDEO  
SURVEILLANCE  
IN USE

**DANGER**  
HIGH  
VOLTAGE

NO  
PARKING  
ANY  
TIME

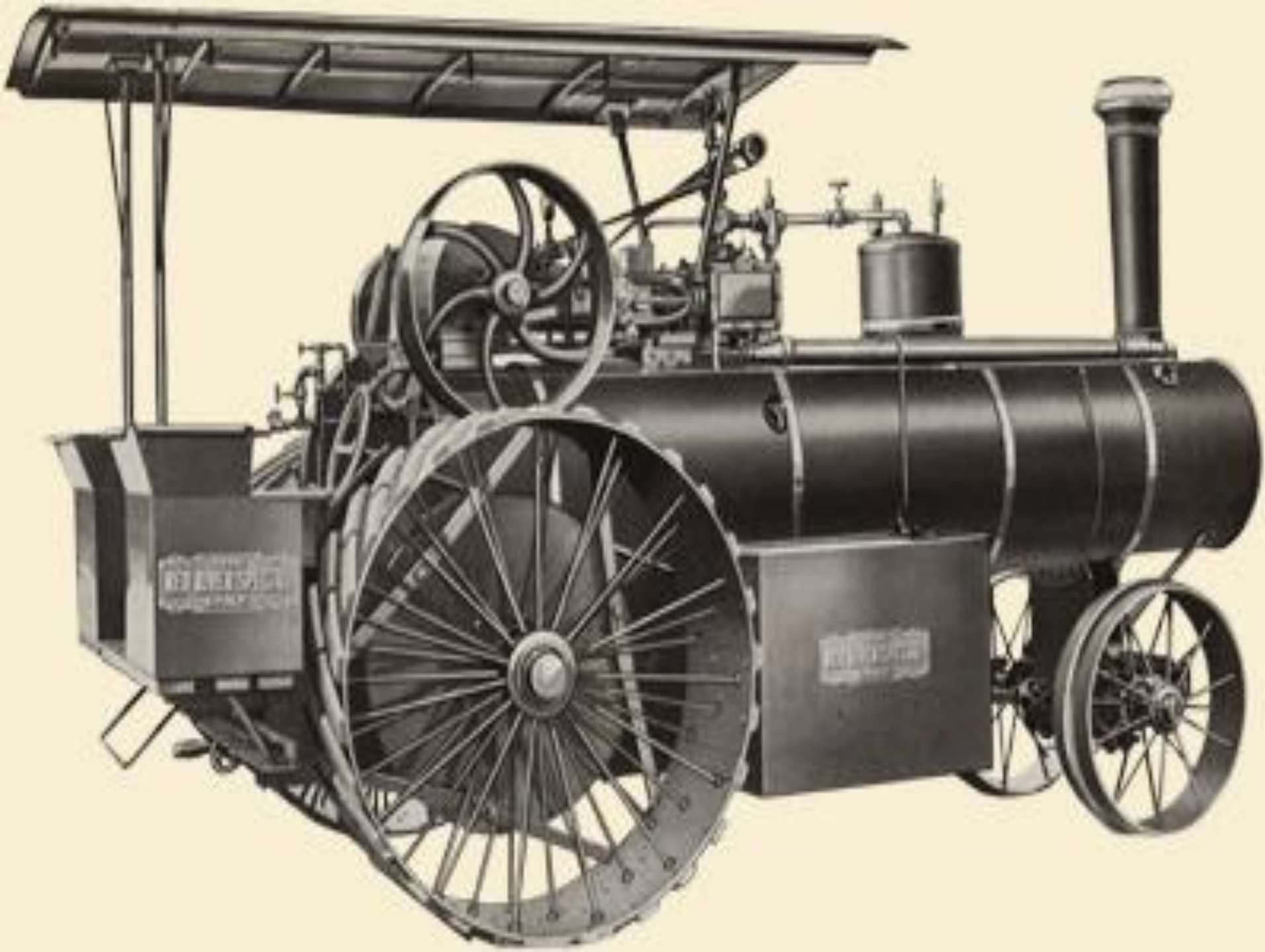






**Daniel  
Boone**









Boyd County -  
1928

An aerial photograph of an industrial facility, likely a refinery or chemical plant. The central feature is a tall, light-colored distillation column with a complex network of pipes and ladders. To the right of the column are several large, cylindrical storage tanks, some of which are covered by a long, low-roofed structure. In the foreground, there are more storage tanks and a large, rectangular building with a flat roof. The facility is surrounded by a dirt road and some greenery. The text "Former - Kentucky Agricultural Energy Corporation" is overlaid on the image.

Former - Kentucky Agricultural  
Energy Corporation



# Commonwealth Agri-Energy

An aerial photograph of an industrial facility, likely a bio-refinery or agricultural processing plant. The facility features several large, cylindrical metal silos, various pipes, and industrial buildings. A large body of water, possibly a reservoir or lake, is visible in the background, surrounded by a wooded area. The text "Commonwealth Agri-Energy" is overlaid in large, white, bold letters across the upper portion of the image.



# ASSESS









# KENTUCKY







**DEDI**

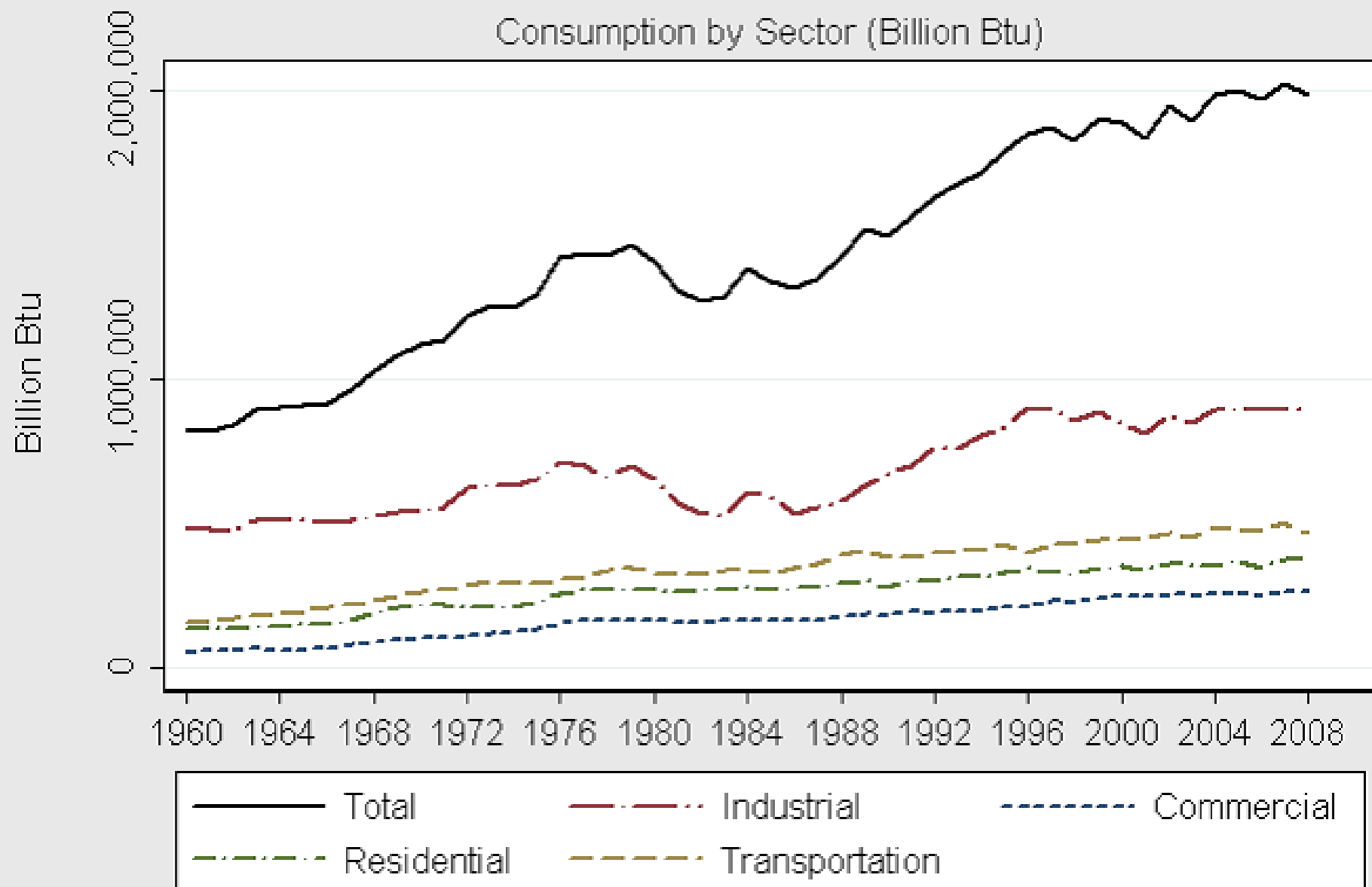
KENTUCKY DEPARTMENT for ENERGY  
DEVELOPMENT & INDEPENDENCE

**Kentucky Energy Profile 2010**

Kentucky Energy & Environment Cabinet

# Kentucky Total Energy Consumption, 1960-2008

Consumption by Sector (Billion Btu)

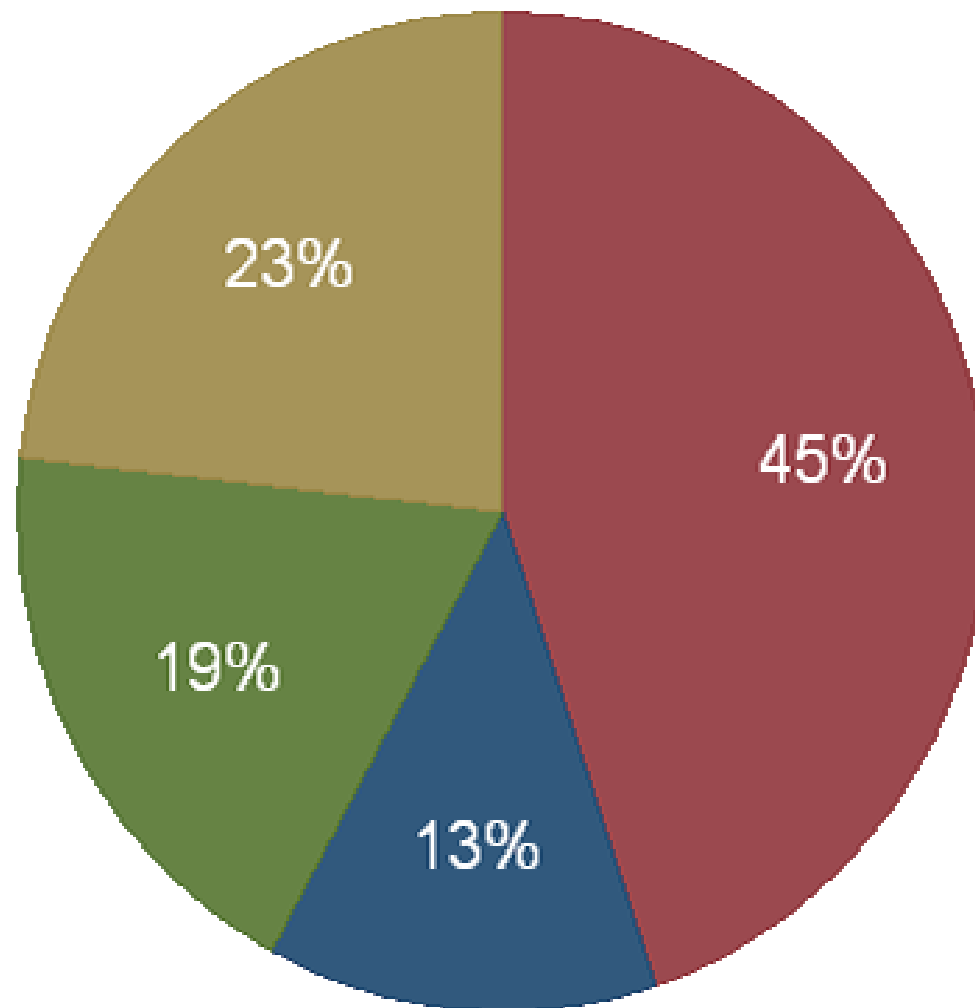


Kentucky Energy Database, EEC-DEDI, 2010



# Kentucky Total Energy Consumption, 2008

Consumption by Sector (%)



Industrial



Commercial



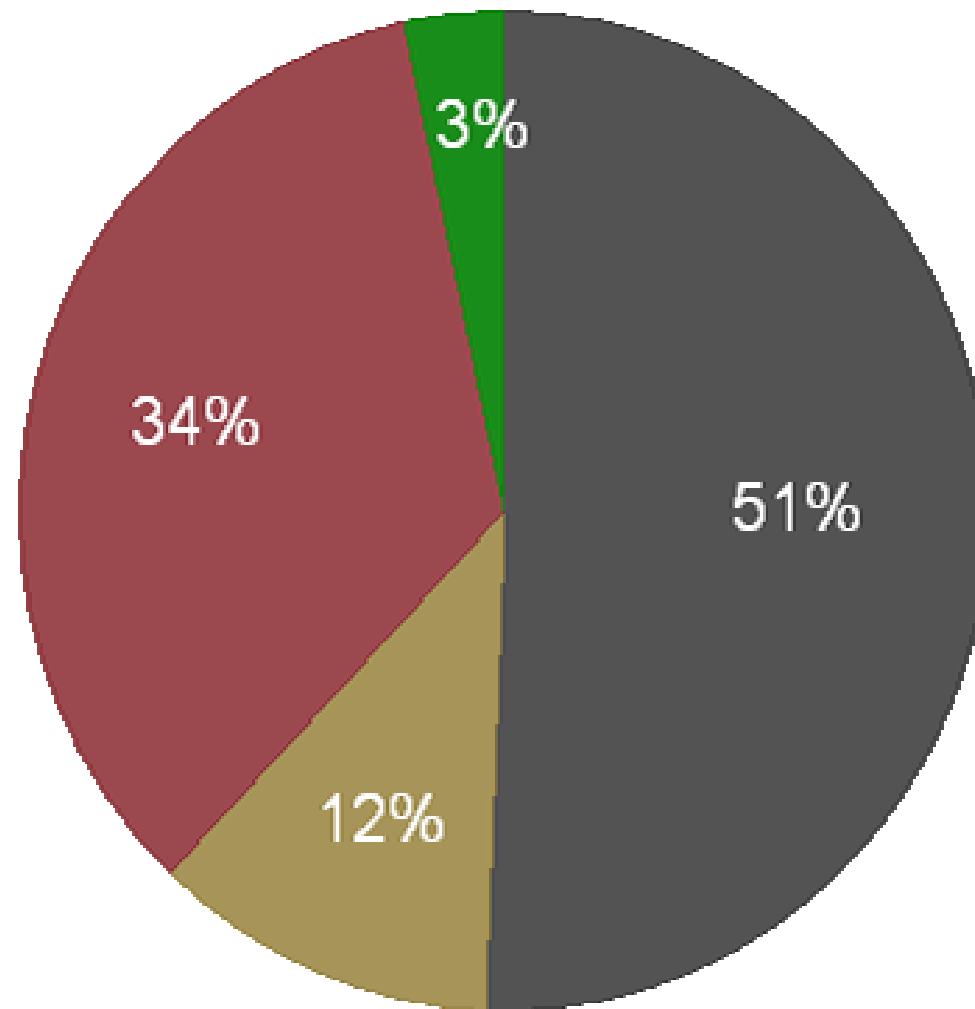
Residential



Transportation

# Kentucky Total Energy Consumption, 2008

Consumption by Fuel Type (%)



Coal

Natural Gas

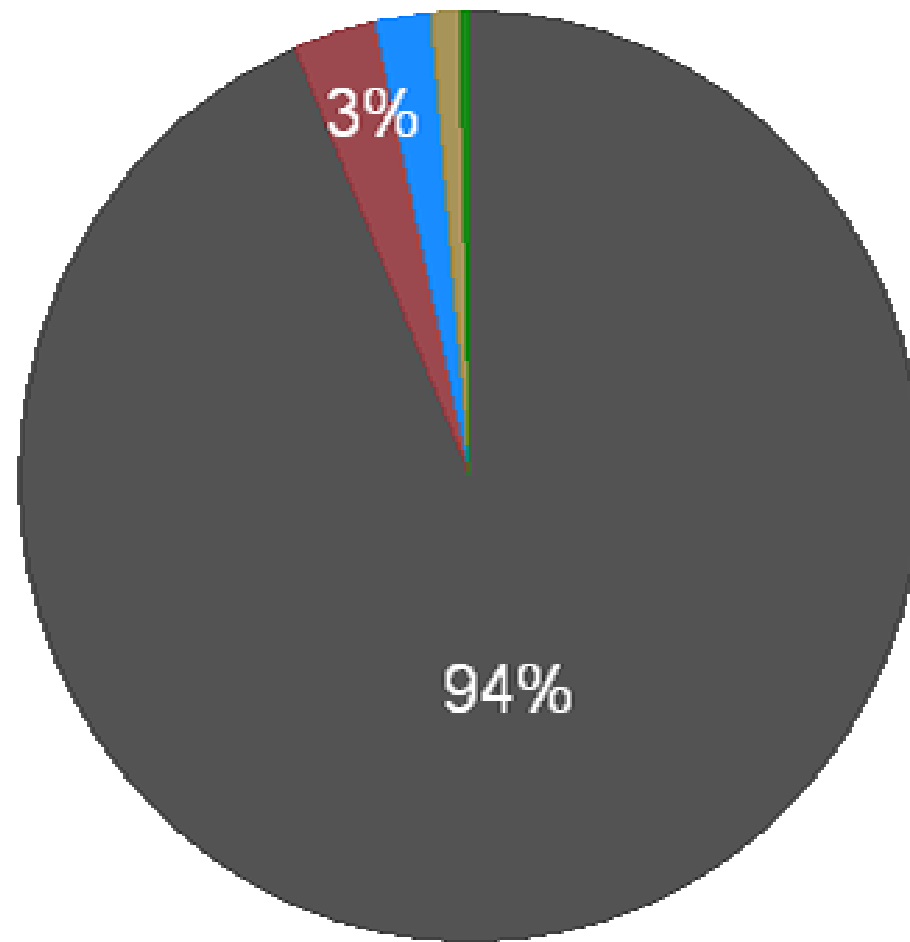
Petroleum

Renewables



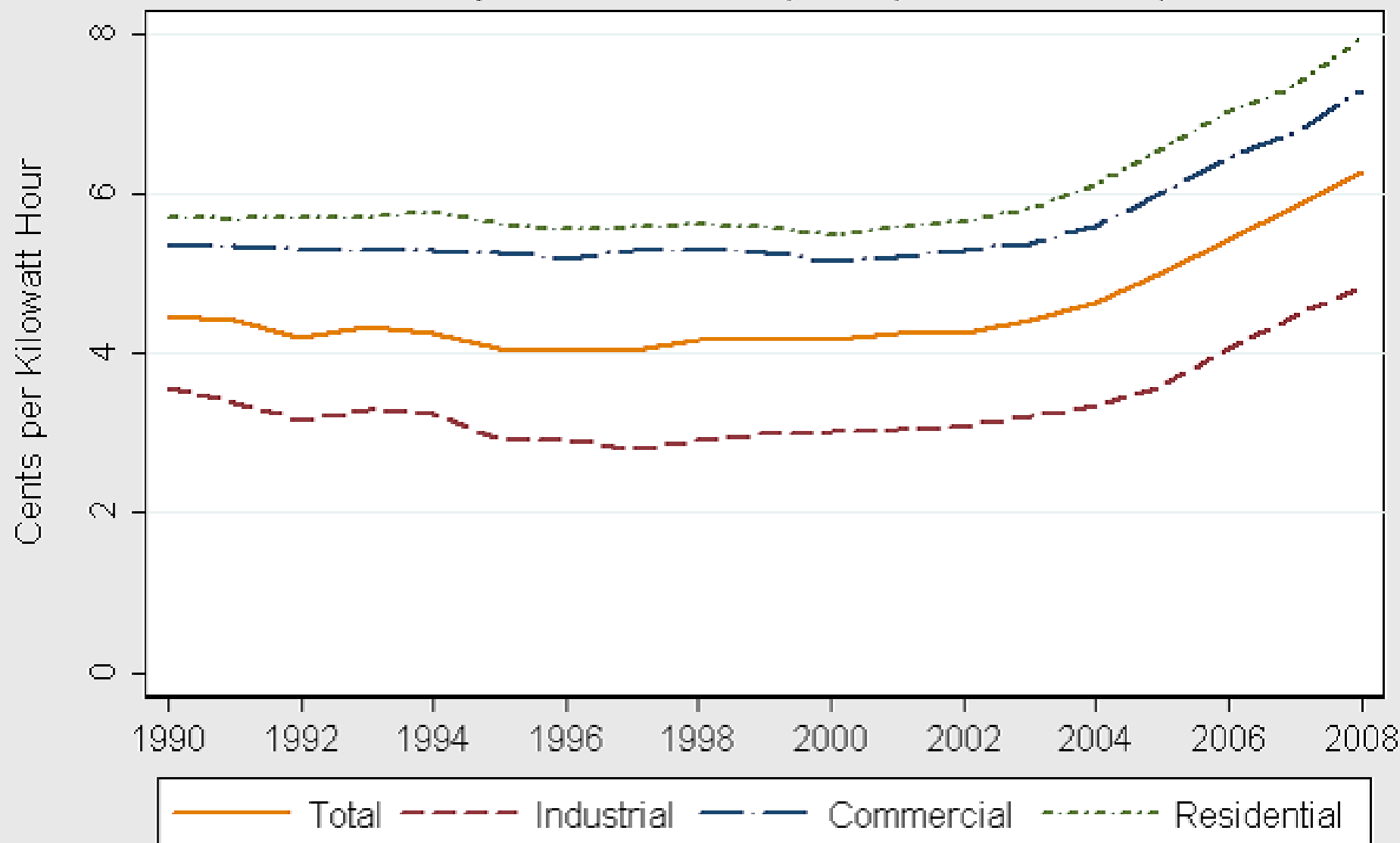
# Kentucky Electric Power Sector Energy Consumption, 2008

Consumption by Fuel Type (%)



# Kentucky Average Price of Electricity, 1990-2008

Price by Economic Sector (Cents per Kilowatt Hour)



Kentucky Energy Database, EEC-DEDI, 2010





# 2007 CENSUS OF AGRICULTURE

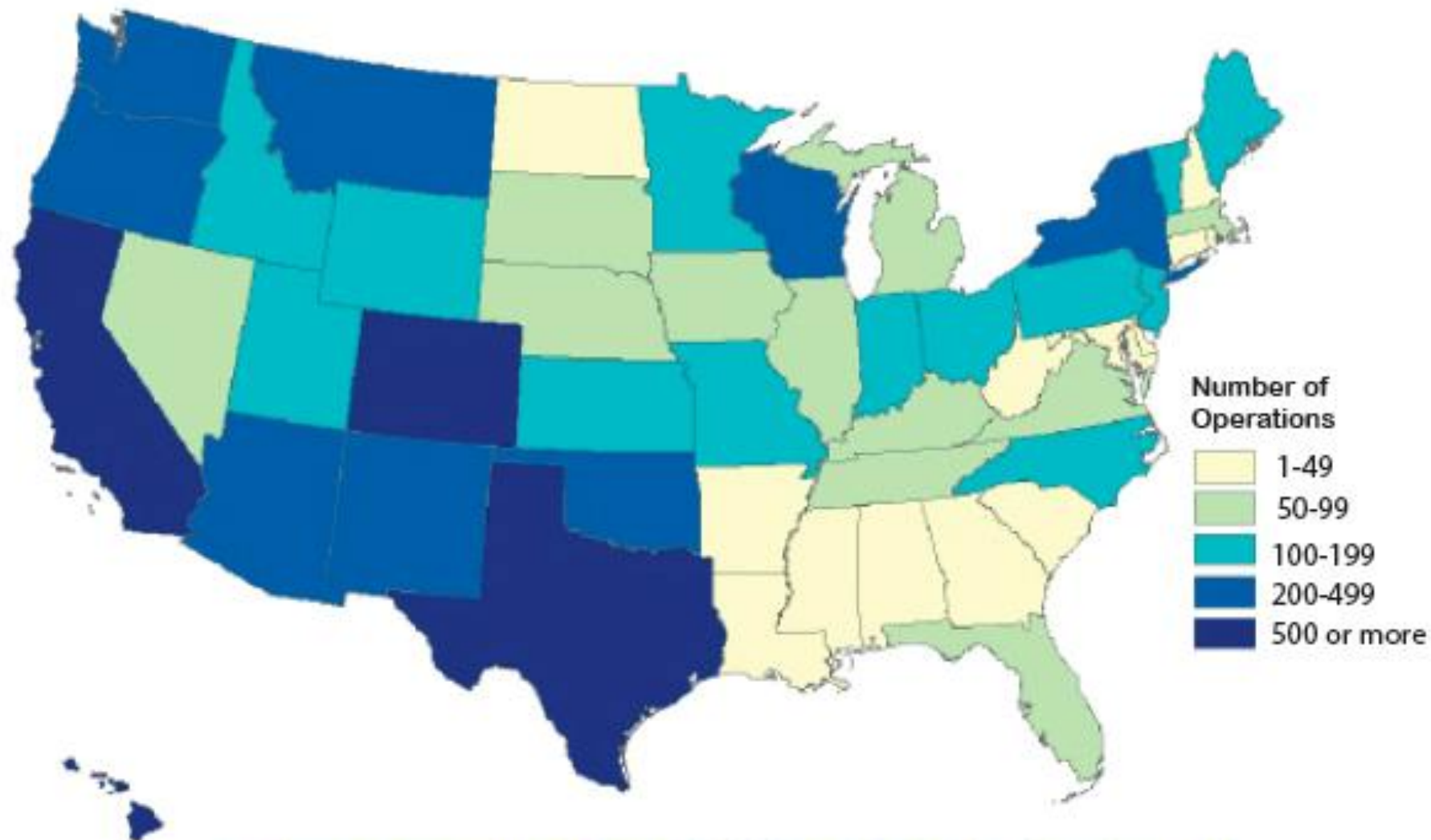
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2009 On-Farm Energy Production

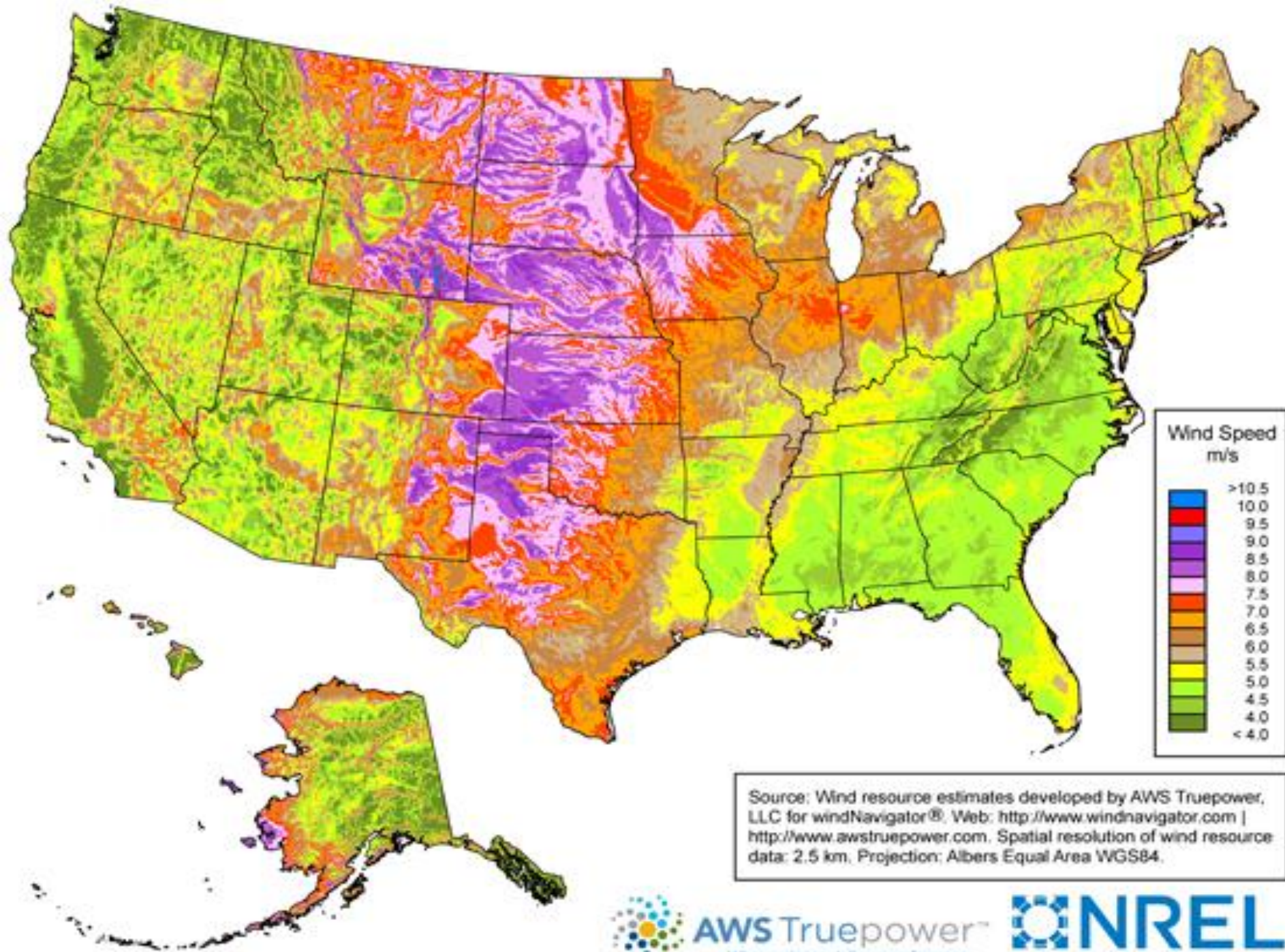
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## Farms Producing Renewable Energy, 2009

(U.S. Total = 8,569 farms)







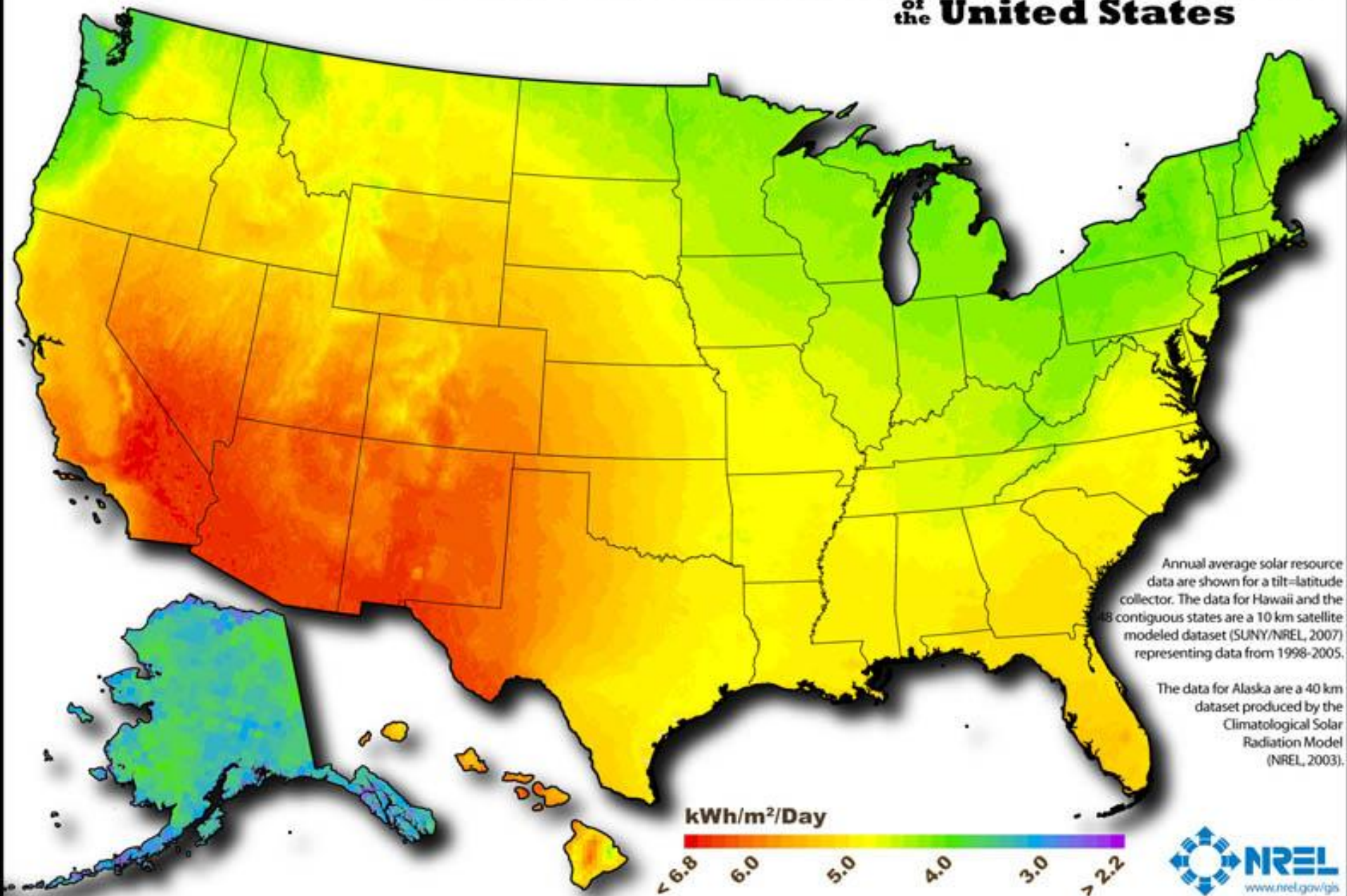
**AWS Truepower™**  
Where science delivers performance.



**NREL**  
NATIONAL RENEWABLE ENERGY LABORATORY



# Photovoltaic Solar Resource of the United States





# **FINAL REPORT**

**From the Executive Task Force on**

## **BIOMASS and BIOFUELS DEVELOPMENT in KENTUCKY**

**A collaborative effort of the Governor's Office of  
Agricultural Policy and the Energy and Environment  
Cabinet**

**December 10, 2009**

# Executive Task Force on Biomass and Biofuel Development

- Kentucky must identify a single agency to coordinate biomass development efforts.
- Kentucky must develop policies to mitigate demand risks.
- Kentucky must develop policies to mitigate supply risks.
- A biomass industry that is *sustainable* must be developed.
- Capitalization mechanisms must be developed.



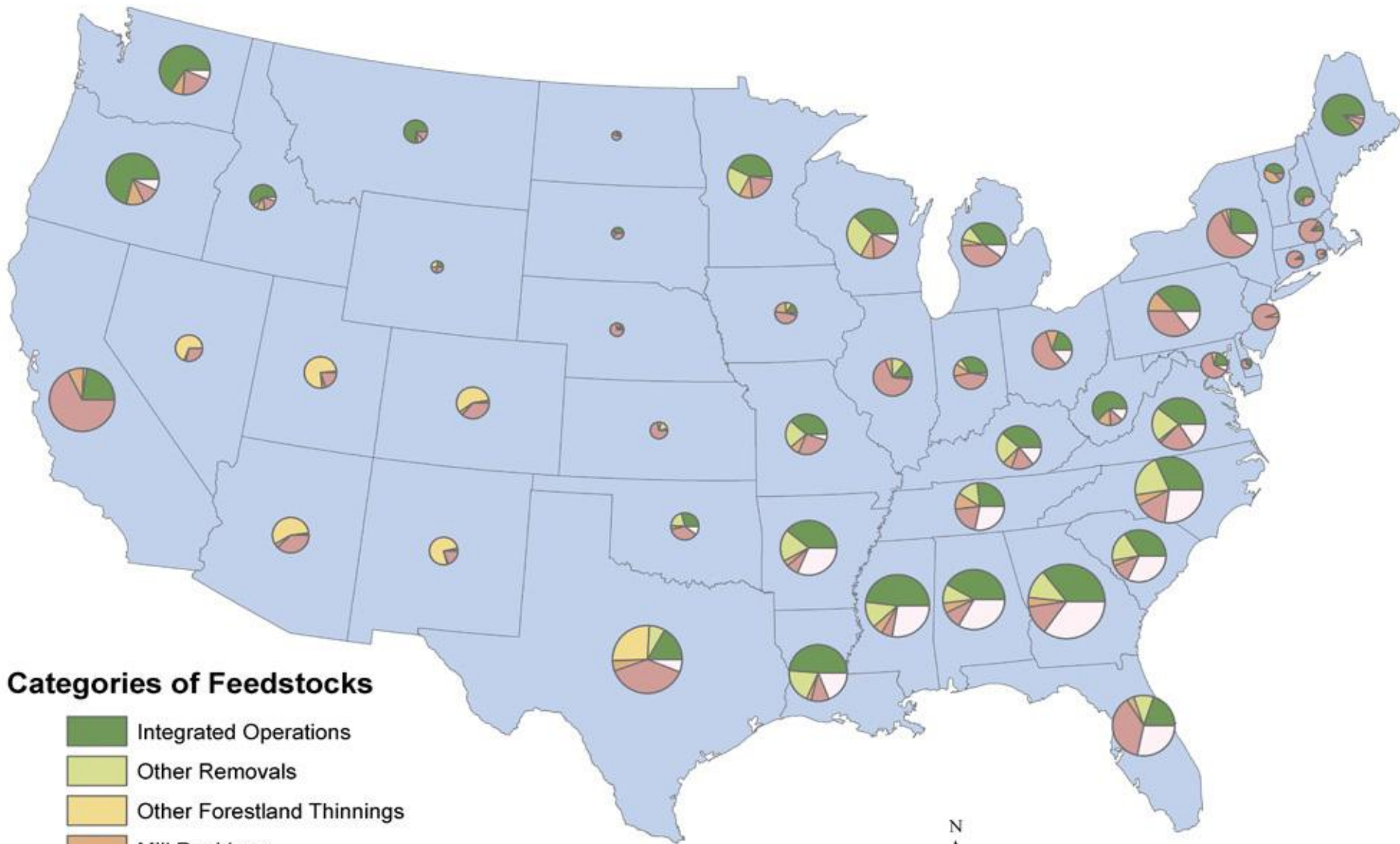


# U.S. BILLION-TON UPDATE

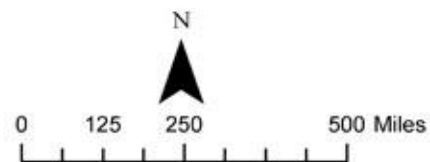
Biomass Supply for a Bioenergy and Bioproducts Industry



August 2011

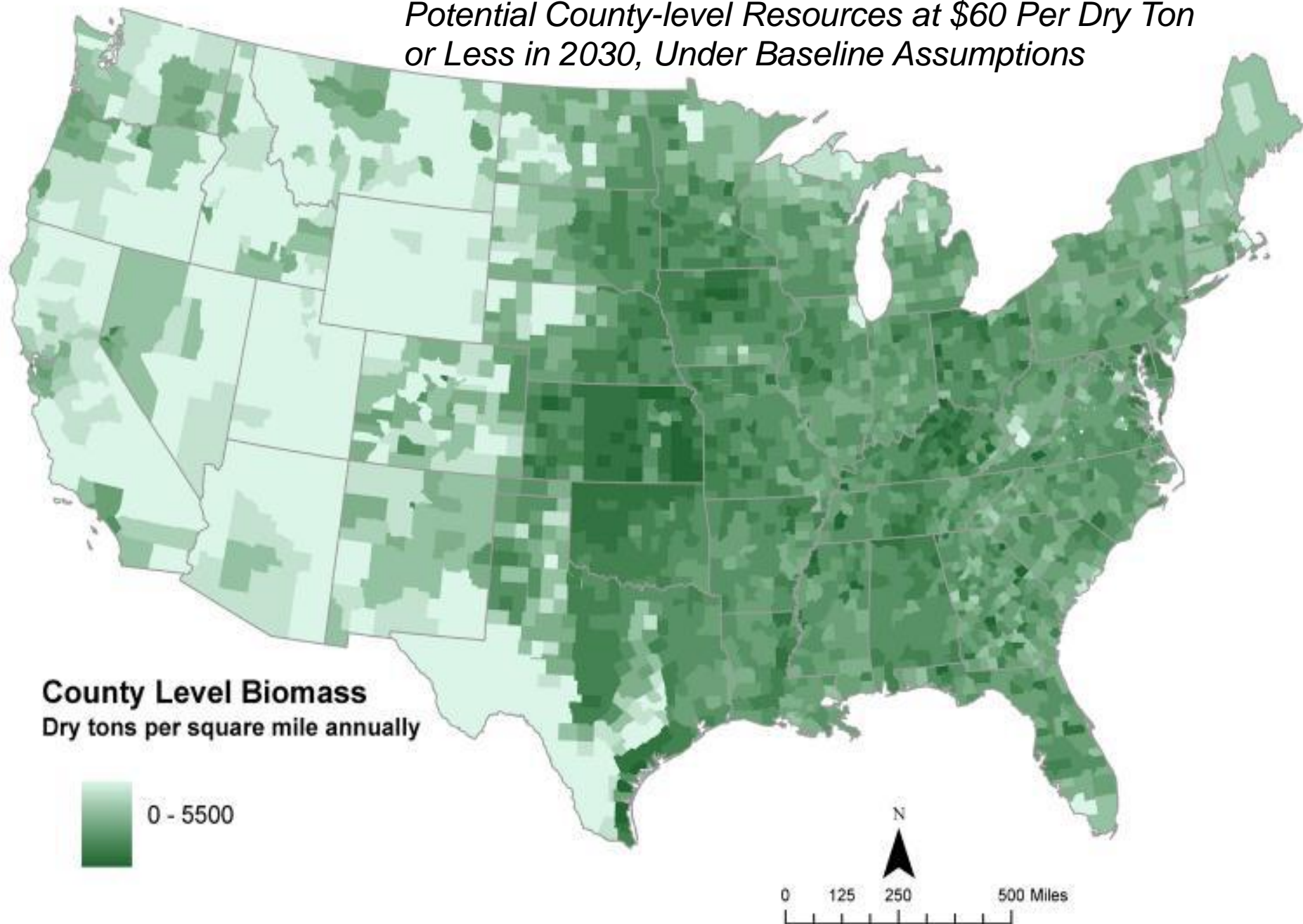


### Categories of Feedstocks



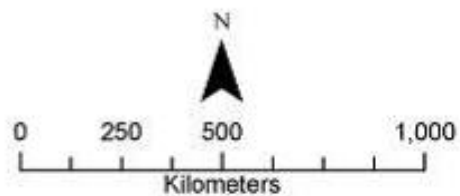
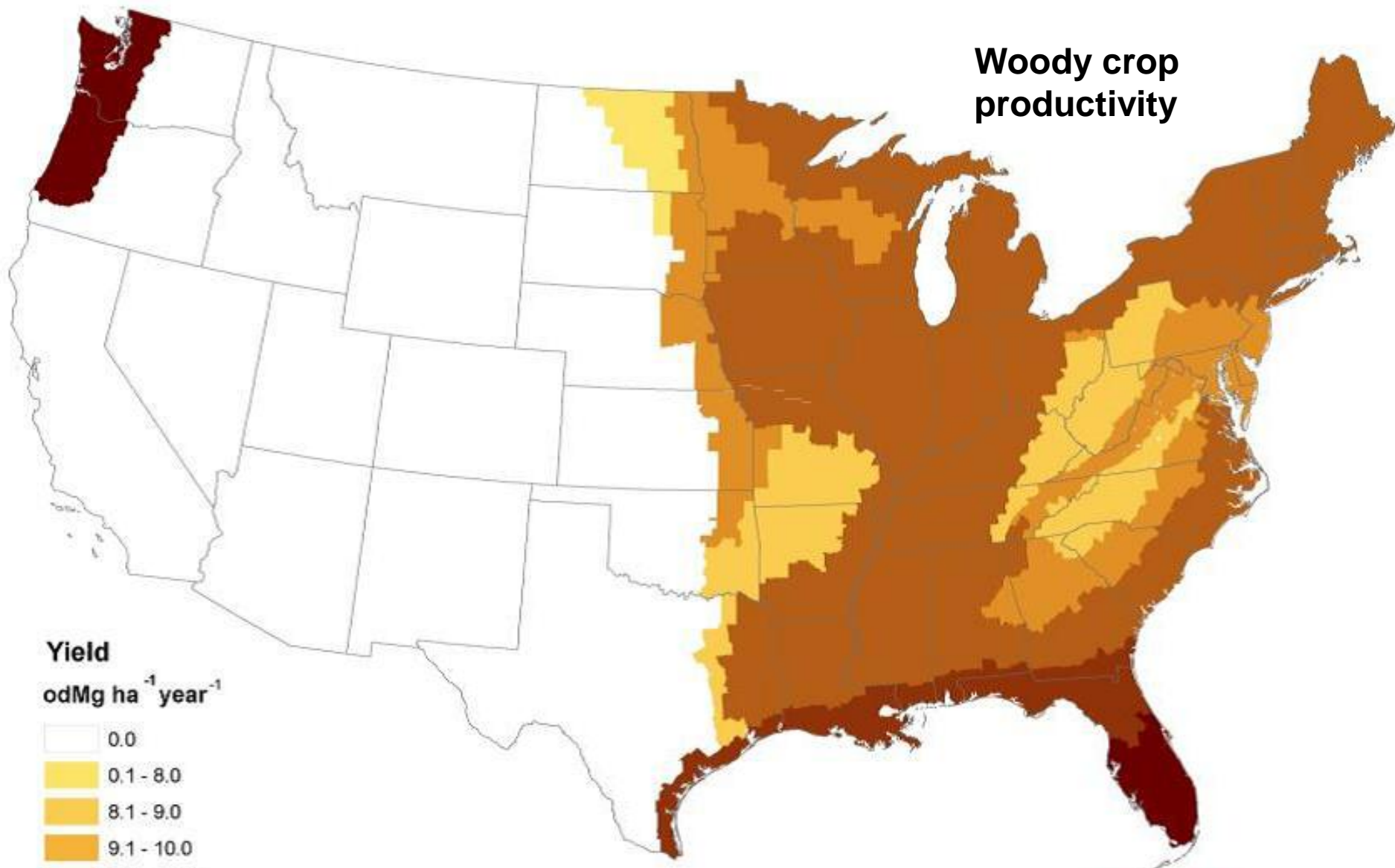
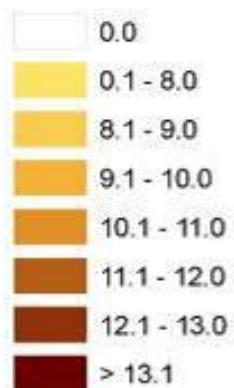


*Potential County-level Resources at \$60 Per Dry Ton  
or Less in 2030, Under Baseline Assumptions*



## Woody crop productivity

**Yield**  
 $\text{odMg ha}^{-1} \text{ year}^{-1}$







KENTUCKY AGRICULTURAL  
DEVELOPMENT FUND

# Disney DREAM



"If you can dream it, you can do it." - Walt Disney



Cons

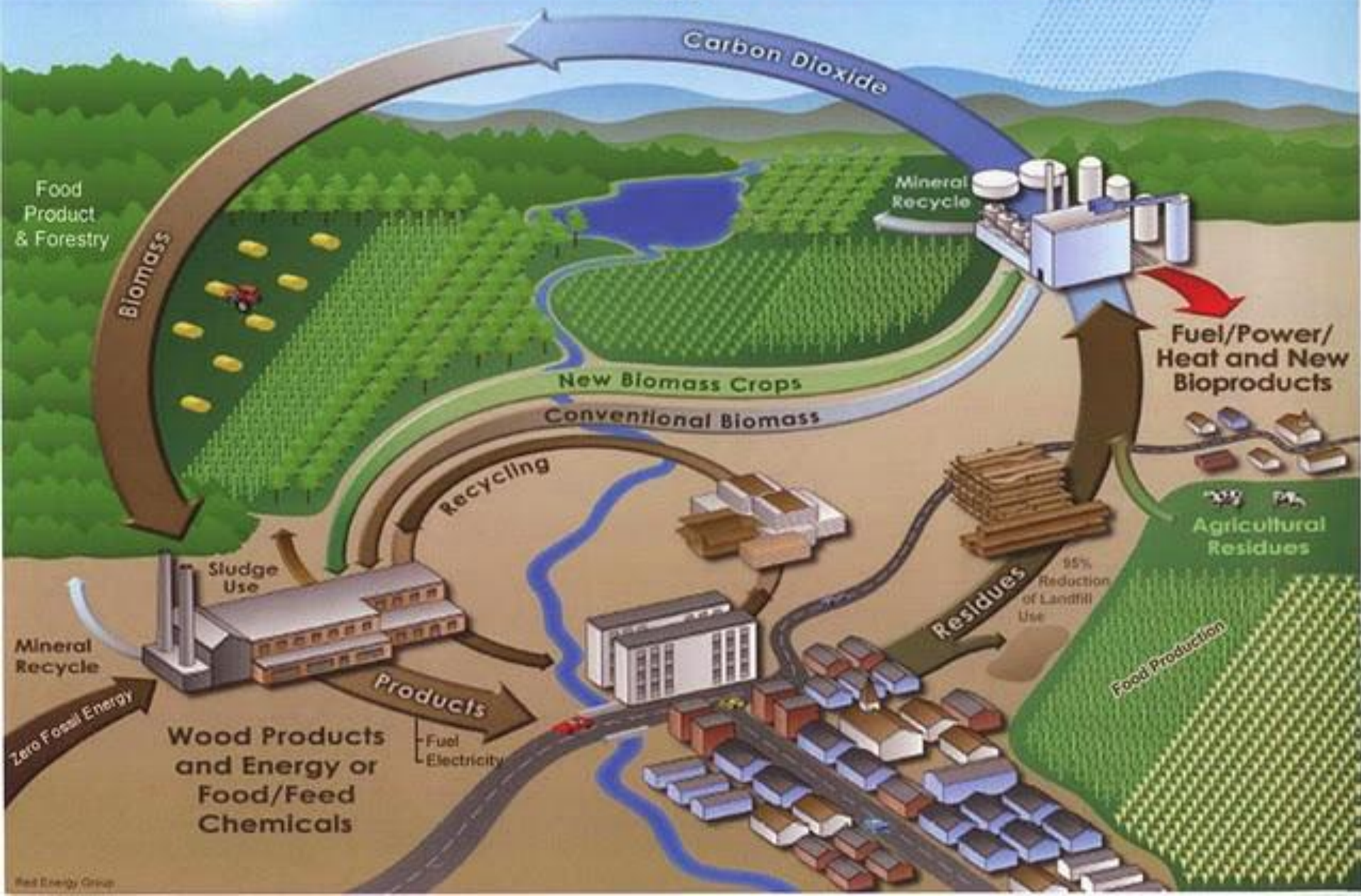
A large, stylized logo for 'HEMP BIO-FUEL'. The word 'HEMP' is in large, bold, black capital letters. Below it, 'BIO-FUEL' is in white capital letters with a red outline. The text is set against a yellow background with a red border. The background features a stylized sunburst or flame pattern with many pointed rays radiating from the center.

**HEMP**  
**BIO-FUEL**

Pros



# Aina Koa Pono Kau Energy Farm





**The dream...**



**Microbes = chemical factories**











LCOR TOM WEAVER  
PI

COR BEAU DUARTE  
ABU









# The power grid of the future

Smart grids add the digital dimension to energy networks. They connect electricity consumers, including private households, businesses and factories, with electricity suppliers. Utilities benefit from real-time information on energy use and power

generated by decentralised producers. This allows them to manage better their energy consumption and networks. And consumers can cut their energy bills by taking advantage of flexible pricing models and up-to-the-minute insight into their power consumption

## Pumped storage hydroelectricity

When electricity is abundant, these plants store energy in the form of water pumped to a high-elevation reservoir. When there is a peak in demand, the water is released generating electricity

## Photovoltaics

Households and other operators feed their locally produced solar energy into the networks

## Electric vehicles

Electric cars are filled up when prices are lowest. Utilities use the cars' batteries to store energy at times of peak load

## Co-generation plants

Utilities use decentralised, independent power plants, such as those located in factories, to provide additional, on-demand energy

## Data centres

Data from energy producers and consumers is fed into the data centre. Utilities can use this information to manage their power plants and grids more efficiently. Customers can access a real-time overview of their energy consumption online

## Houses

Every house is connected to an electricity and data network. A communications device captures data on power use and transmits it to utilities every second. The device also communicates the current energy price to households, which allows customers to take advantage of lower rates

## Wind farms

Output from wind turbines is subject to fluctuation. In future the smart grid will provide real-time information on wind energy, so utilities can better manage their output

## Power plants

Thanks to decentralised energy suppliers, their contribution to the grid is reduced

## Biogas

Co-generation plants use biogas, produced from municipal waste, for example, to generate heat

## Manufacturing

Factories can program their machines to operate during off-peak times, cutting costs

## Data hubs

To efficiently manage data, real-time information on energy generation and consumption is processed at hubs distributed throughout the network. They support the process of balancing grid load











# Research

## Advancing the Bioenergy Supply Chain

**Biofeedstocks**

**Endusers**

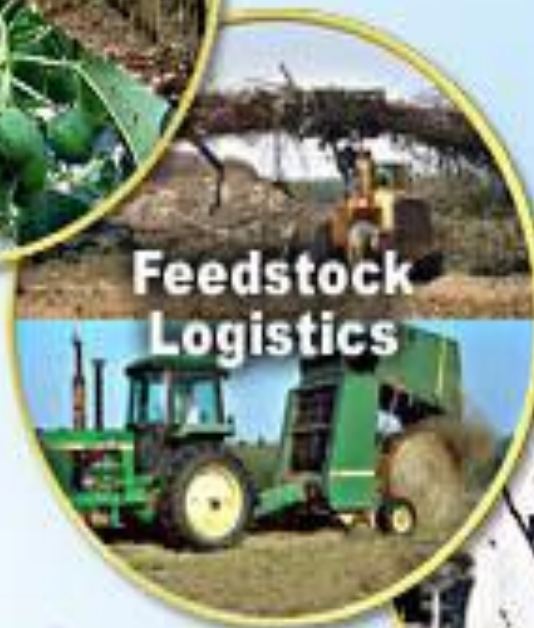
**Feedstock  
Logistics**

**Product  
Delivery**

**Biorefineries**

**Information**

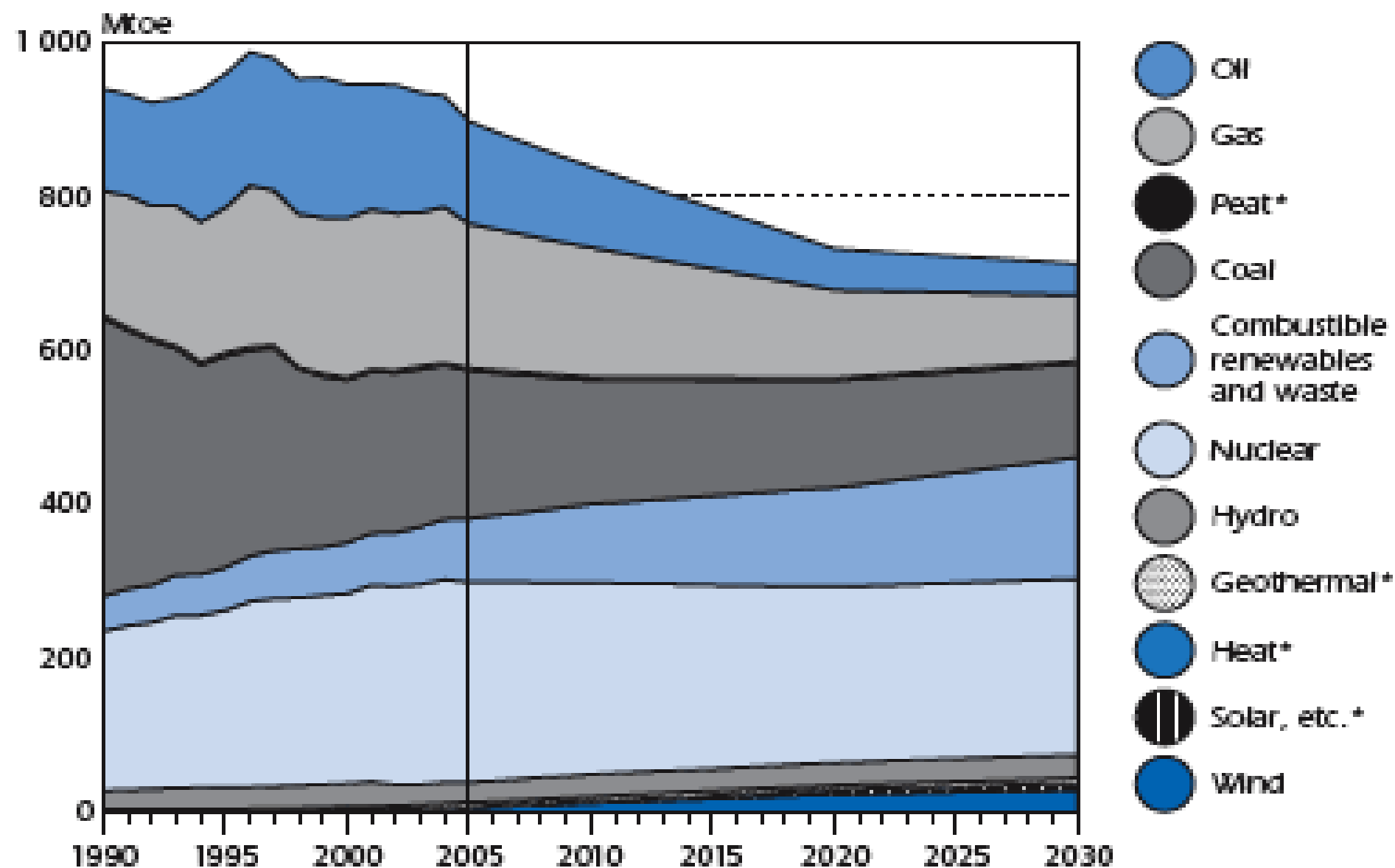
**Sustainability**



[illegible]

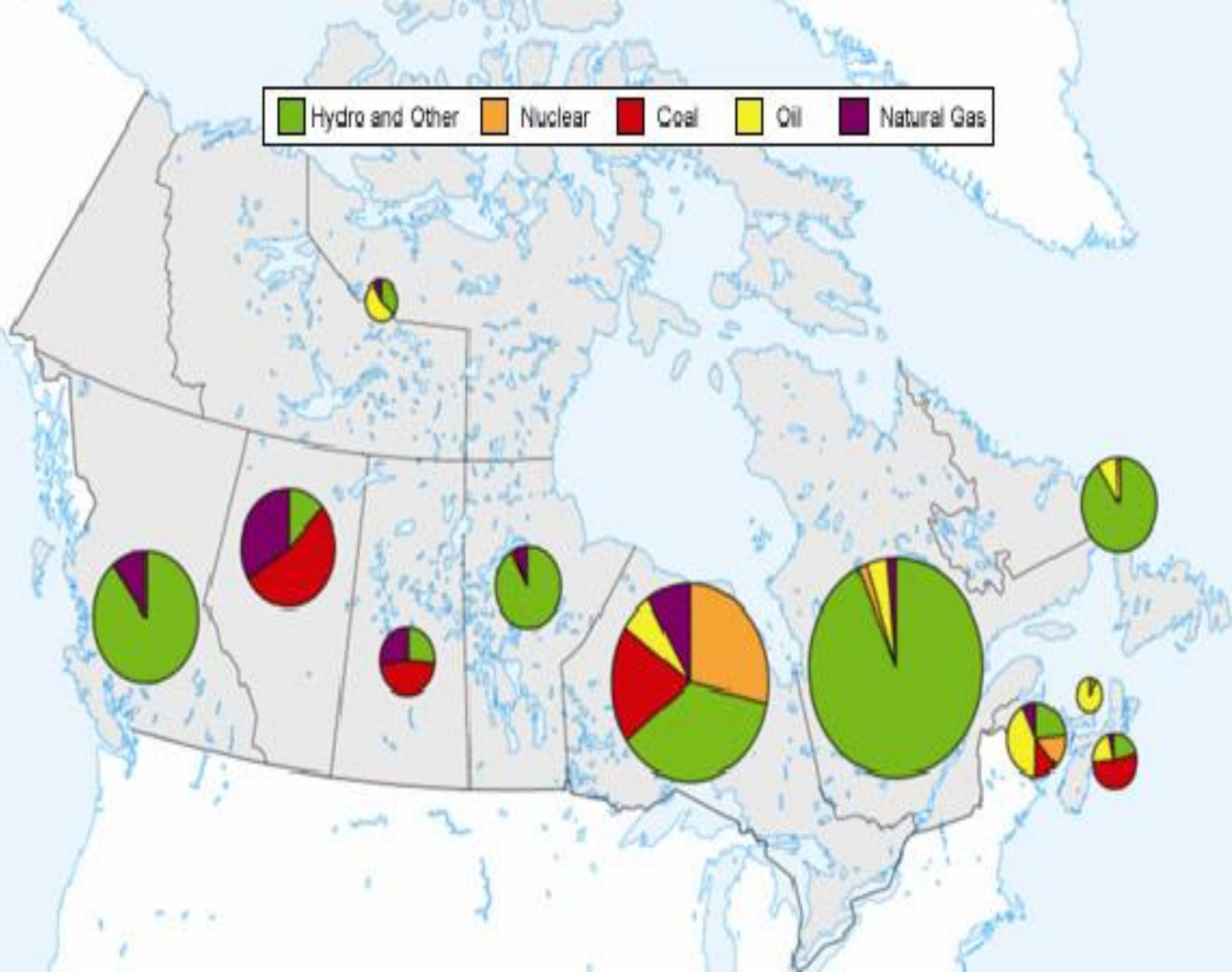


# Energy Production by Source, 1990 to 2030



\* negligible

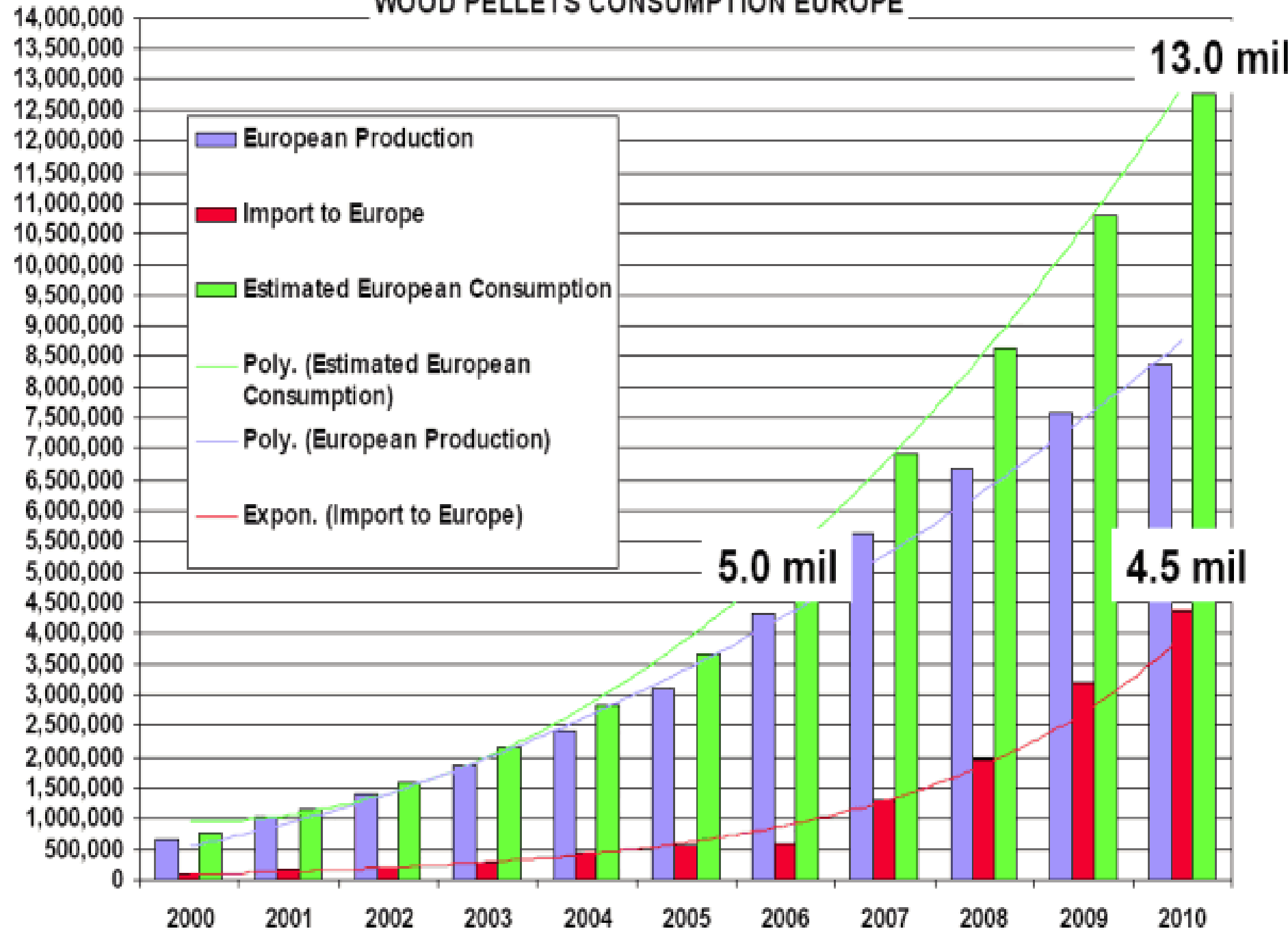
Sources: *Energy Balances of OECD Countries*, IEA/OECD Paris, 2007 and EU submission.





METRIC TONNE

WOOD PELLETS CONSUMPTION EUROPE





---

consensus





COMMONWEALTH OF KENTUCKY

UNITED WE STAND

DIVIDED WE FALL









YOU FIRST.

LEFT

RIGHT

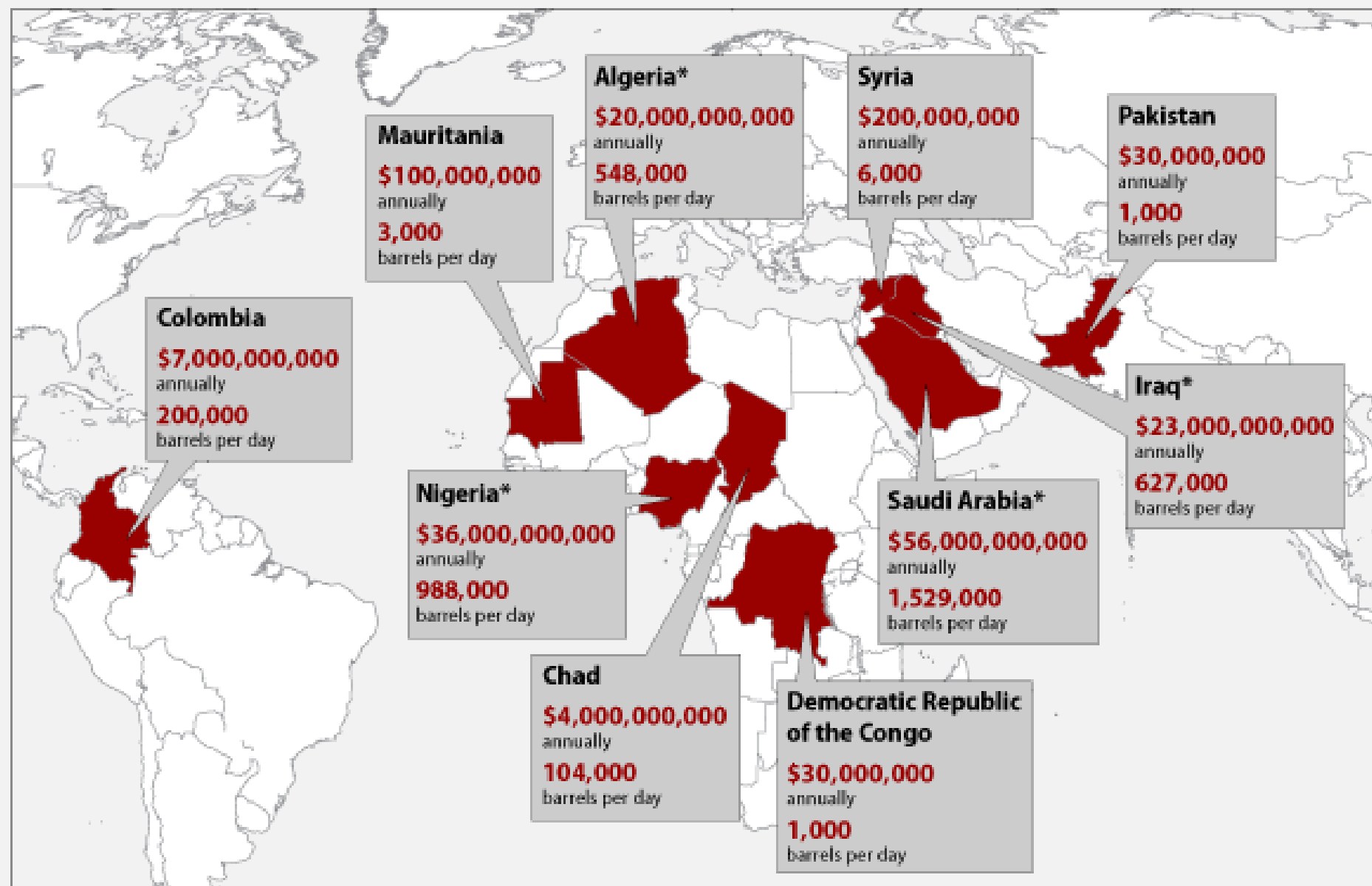
MIDDLE

AREA of AGREEMENT.





## 2008 crude oil imports from unstable countries



Source: U.S. Energy Information Administration, "Company Level Imports Historical," available at [http://www.eia.doe.gov/oil\\_gas/petroleum/data\\_publications/company\\_level\\_imports/cli\\_historical.html](http://www.eia.doe.gov/oil_gas/petroleum/data_publications/company_level_imports/cli_historical.html).

# Vulnerability due to reliance on imported oil

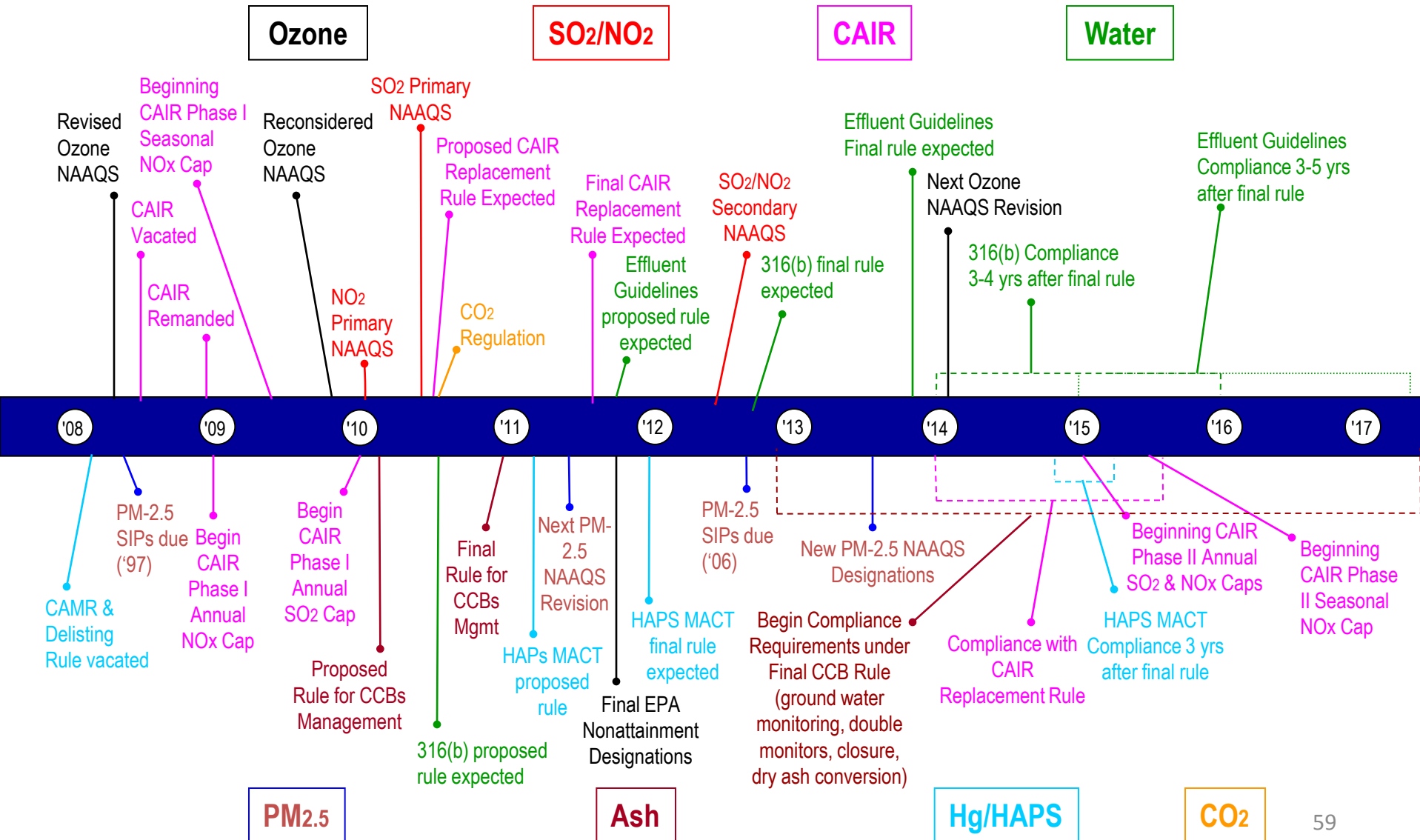
Kentucky Production  
2.5 mil. barrels

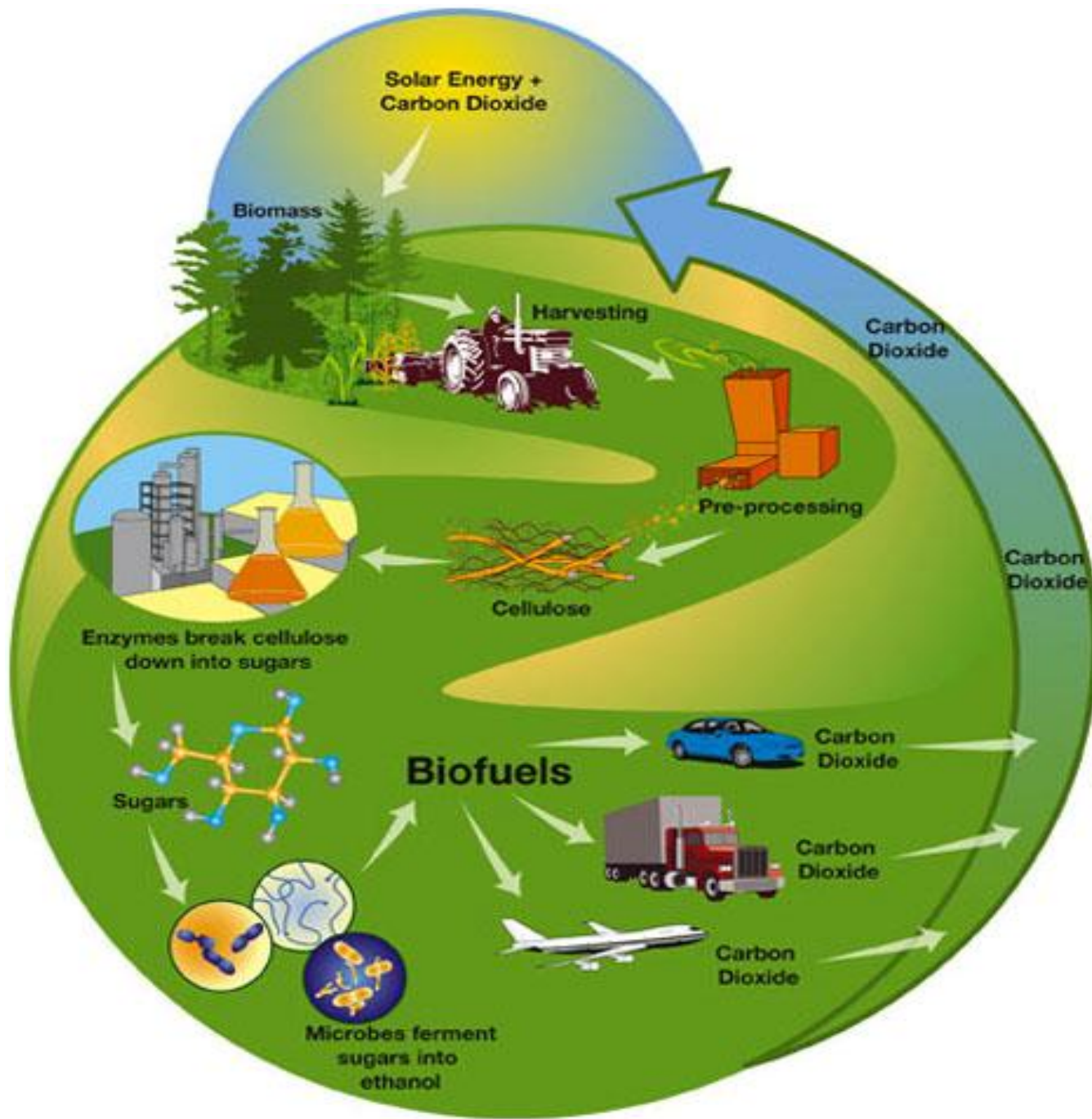
Kentucky Consumption - 125.3 mil. barrels





# Environmental Regulatory Timeline for Coal Units











TOGETHER WE CAN ACCOMPLISH WHAT NEITHER OF US CAN DO ALONE

**DUPONT** **DANISCO** **GENENCOR**  
A Danisco Division

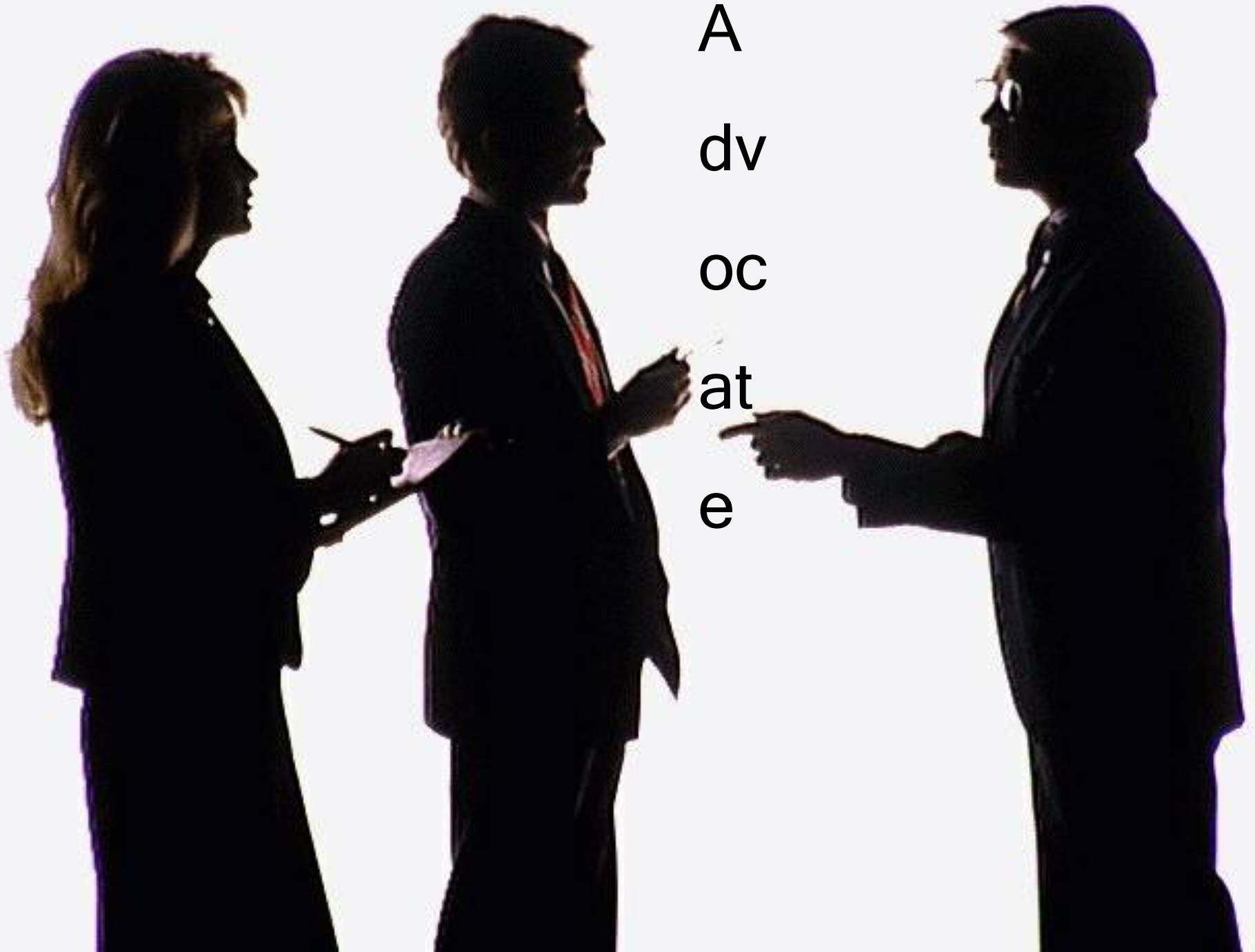


...AND THAT  
IS WHY WE  
LIFT ON  
THREE...

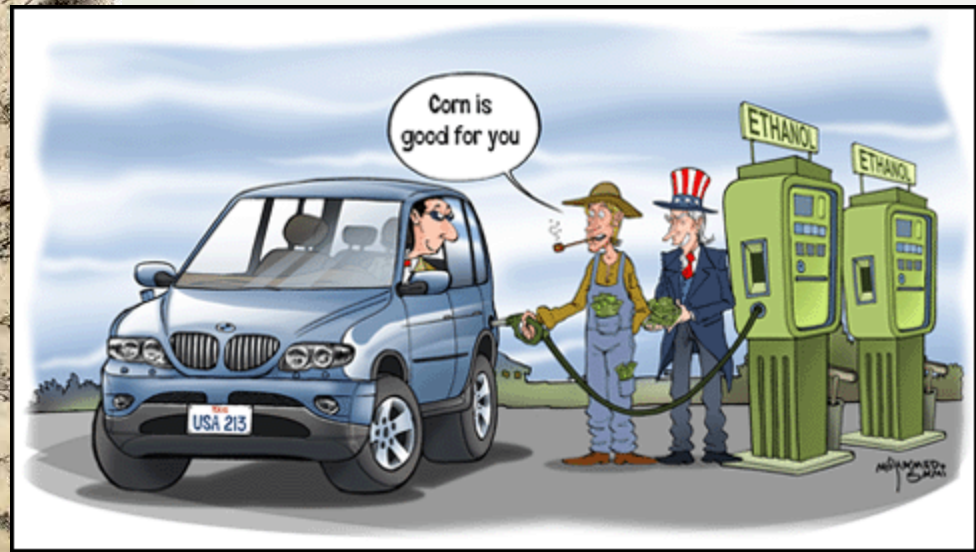


COMMUNICATION

A  
dv  
oc  
at  
e







Joe Klein: How Al Gore Could Save The Democrats



Hillary Clinton On Why She Won't Quit



R.E.M. Rises from The Dead

# TIME

## The Clean Energy Myth

BY MICHAEL GRUNWALD

Politicians and Big Business are pushing biofuels like corn-based ethanol as alternatives to oil. All they're really doing is driving up food prices and making global warming worse—and you're paying for it



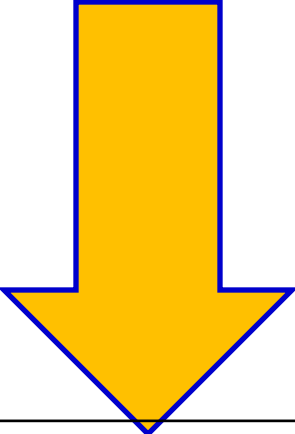
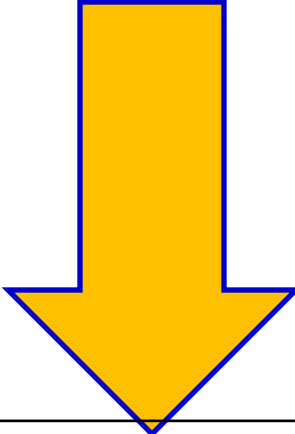
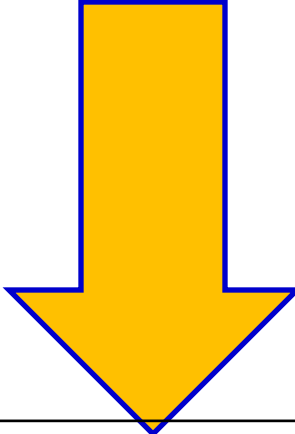
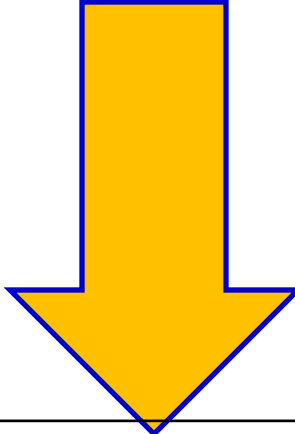
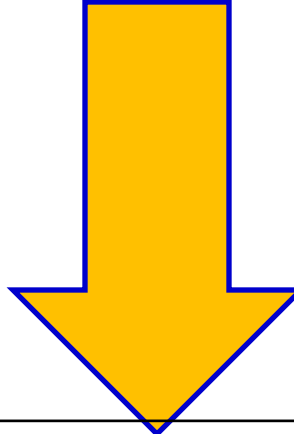
THIS IS REAL MAPLE SYRUP, SON, FROM REAL MAPLE TREES. THAT FAKE STUFF IS MOSTLY JUST HIGH FRUCTOSE CORN SYRUP.

FROM REAL CORN? COOL! CORN TASTES A LOT BETTER THAN MAPLE TREES.

© 2011 Brian Griffin, dist. by Washington Post Writers Group

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# Corn's Impacts, 1987-2007

Land Use	Soil Loss	Irrigation	Energy	Climate
Amount of land to produce one bushel of corn	Soil loss per bushel, above a tolerable level	Irrigation water use per bushel	Energy used to produce one bushel	Emissions per bushel
				
<b>37%</b>	<b>69%</b>	<b>27%</b>	<b>37%</b>	<b>30%</b>



# Killing Myths....



# UK: Don't Blame Corn

HM Government

The 2007/08 Agricultural  
Price Spikes: Causes and  
Policy Implications



- Available evidence suggests that **biofuels had a relatively small contribution** to the 2008 spike in agricultural commodity prices

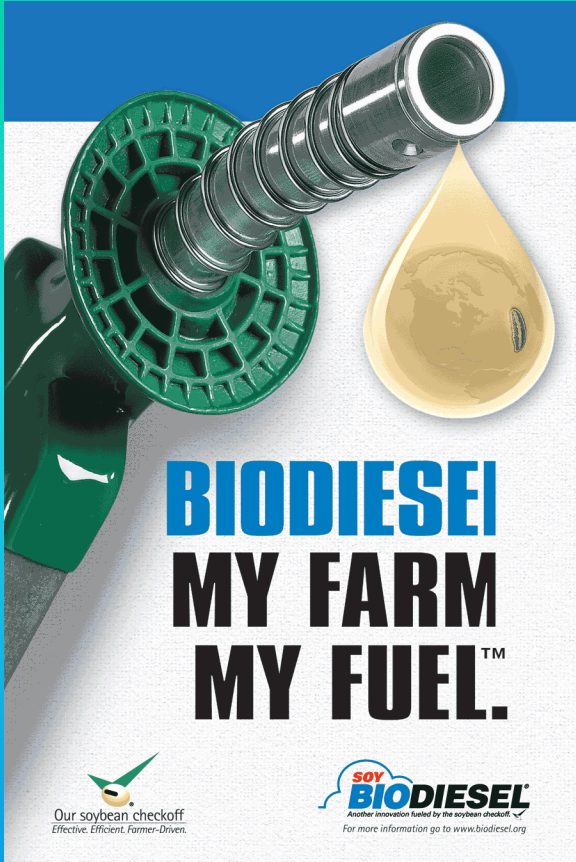
March 2010



LOGGER EDUCATION/  
CONTINUING ED.

**“Future Affects of  
Biomass Production”**

Inside Exhibit Building  
Start Time: 10:00 a.m.



**BIODIESEL**  
**MY FARM**  
**MY FUEL.™**

Our soybean checkoff.  
 Effective. Efficient. Farmer-Driven.

**SOY BIODIESEL**  
 Another innovation fueled by the soybean checkoff.™  
 For more information go to [www.biodiesel.org](http://www.biodiesel.org)




**RE-ENERGIZE  
 AMERICA**



**BIOMASS POWER**  
 ASSOCIATION

*Natural Energy, Naturally*

**SOY BIODIESEL**  
 Another innovation fueled by the soybean checkoff.



**THE AMERICAN WAY TO FUEL**

**Made in the USA**



**E85**  
 85% Ethanol

[www.E85Fuel.com](http://www.E85Fuel.com)





leadership

motivation

dedication

excellence

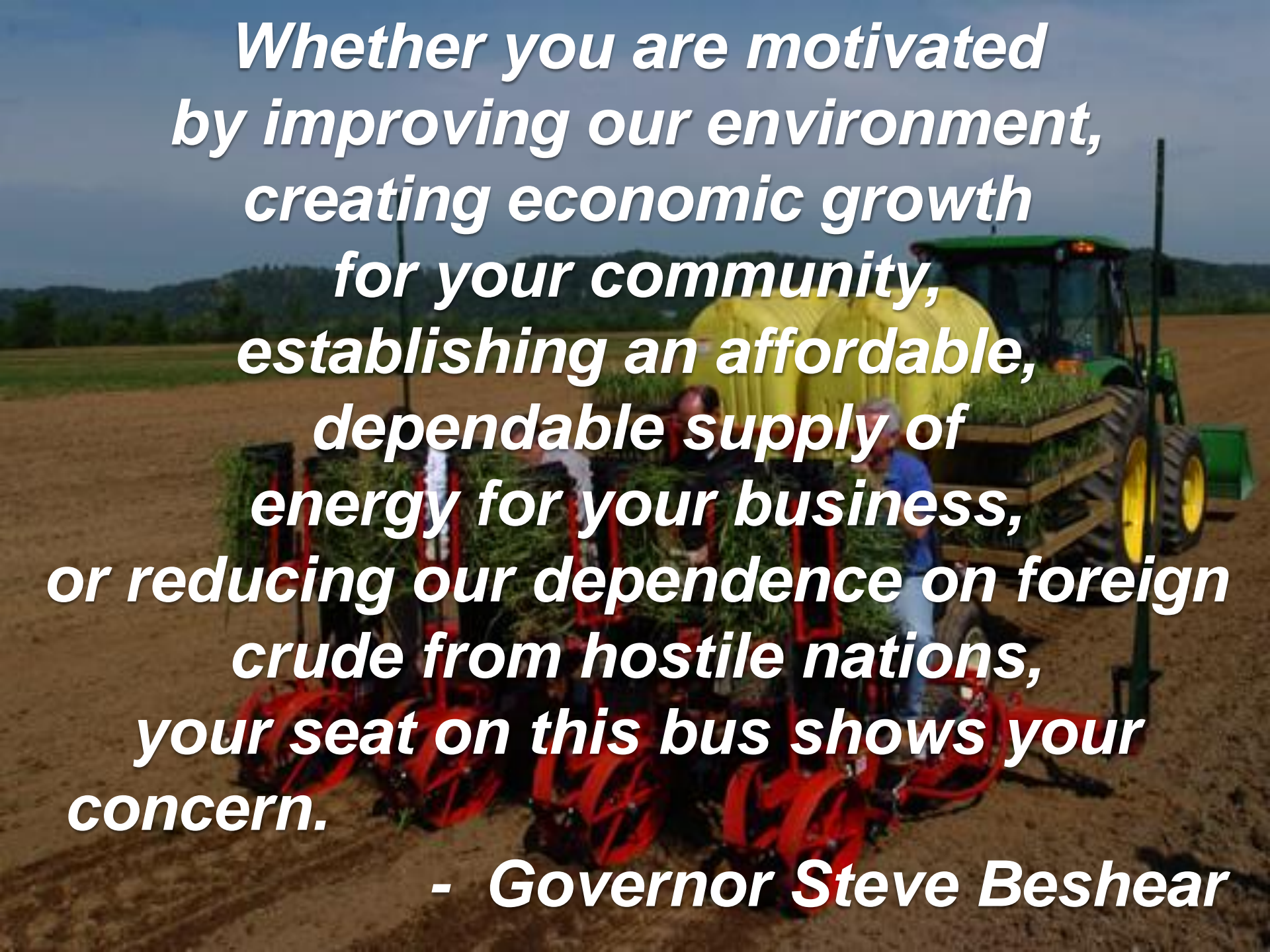
prive

discipline

heart

passion



A green tractor is pulling a red hay rack filled with hay in a field. The tractor is moving from right to left. The hay rack is a large, rectangular frame filled with hay. The tractor has a green cab and yellow wheels. The background shows a field with some trees in the distance under a clear sky.

*Whether you are motivated  
by improving our environment,  
creating economic growth  
for your community,  
establishing an affordable,  
dependable supply of  
energy for your business,  
or reducing our dependence on foreign  
crude from hostile nations,  
your seat on this bus shows your  
concern.*

*- Governor Steve Beshear*

A red tractor on the left and a green tractor on the right are holding a white banner. The red tractor is a Case IH 8255, and the green tractor is a John Deere 7400. They are parked on a gravel area with a field of tall grass in the background. The banner is held up by the tractors' front loaders. The text on the banner is "Welcome Kentucky's Interim Joint Committee on Agriculture". There are also logos for "K&L Seeds" and "K&L Seeds" on the banner.

186  
K&L Seeds  
K&L Seeds  
Welcome  
Kentucky's Interim  
Joint Committee on Agriculture









*Kentucky's resource base and existing assets  
give us a tremendous advantage in the area of bioenergy.  
Our transportation infrastructure (road, rail, & water)  
is another advantage we have over many other states.  
The federal government has set out  
some ambitious requirements for the use of bioenergy.*

*—Jeff Hall, The Capstone Group*

























**Tim Hughes**  
**Director – Division of Biofuels**  
**Kentucky Energy & Environment Cabinet**  
**(502) 564-7192**  
**[TimD.Hughes@ky.gov](mailto:TimD.Hughes@ky.gov)**